Remarks

After the foregoing amendment, independent claims 1 and 36 are pending.

Amendments

Claim 1 has been amended to address the 112 issues identified by the examiner. No new subject matter has been added to the claim. The scope of claim 1 has not been changed. Applicant believes that the cosmetic amendments to these claims will not require any additional searching by the examiner.

New Claim

New claim 36 is directed to the data model aspect of the invention. New claim 19 avoids the "worldline" language of cancelled claim 19, which was also directed to the data model.

The Claimed Data Model Technology

The primary differences between the claimed data model and conventional data models found in the prior art are (1) the chronological nature inherent in each data element; and (2) the link between common events that exist in two data elements in order to associate the two data elements. These unique aspects of the claimed data model are not found in the prior art.

Rao Reference

Rao teaches a "bottom up" multidimensional data model that partitions atomic data values at the micro level into several dimensions. Rao defines a dimension as an independent partitioning of the set of all values. (Column 4, lines 40 – 41). Thus, the fundamental organization of data taught by the Rao data model is based on multiple ways to divide up atomic values, which are defined as the smallest unit of data which continues to have meaning in the physical world. (Column 4, lines 30 – 31).

While the base unit of the data model taught by Rao is the atomic value, the base unit of the claimed data model is referred to as a "data element" in claims 1 and 36. The important difference between the atomic value of Rao and the data element of the present application is that the atomic value is the smallest unit of data which continues to have meaning in the physical world while the data element is a top-level data structure that includes other data structures (i.e., frames and events) and atomic values (referred to as quantitative data in the claims).

Thus, in contrast to the "bottom up" model taught by Rao, the claimed data model is a "top down" model that does not rely on organizing data at the atomic level (i.e., the partitioning of atomic values into dimensions as taught by Rao). Instead, the claimed data model and method organizes information into a data element that comprises a frame (or multiple frames) and an event (or multiple events). The frame includes quantitative data – these would be like the atomic values of Rao. The difference between the claimed data model and Rao, importantly, is that the atomic values in the frame do not define the organization of the data model, as taught by Rao.

Furthermore, Rao does not teach an event that is part of a data element. An event is a data structure that is part of a data element and is defined, at least in part, by chronological data. The chronological data can also be atomic values. For example, a start date and an end date could be separate atomic values that chronologically define the event. Additionally, the event also includes one or more links. These links point to the same event that is included in another data element. Thus, a link associates two data elements based on a common event that is shared by each of the linked data elements.

The data model described in Rao fails to teach the claimed invention because it does not contemplate the top down organization of data by elements and the linking of the various elements to each other by common events.

A review of Figure 7 in Rao is instructive. First, Rao shows several cells at the bottom level. These cells are divided into sticks based on what product the data value belongs to. Additionally, the sticks themselves are separated out by year. The various sticks are then collected together into a slab, which represents the atomic data values over time for a particular product. The slabs are shown grouped together into a 3-dimensional block. Rao then describes the groupings in Figure 7 as corresponding to successive levels in a data consolidation path. (Column 6, lines 54 – 57). This description emphasizes the "bottom up" nature of Rao since the path goes from many atomic data values in the cells to successive levels of consolidation.

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Conclusion

Applicant believes that Rao and the prior art of record do not teach the claimed data model and method of modeling data. Rao teaches a model with a "bottom up" approach to organizing atomic data values while the invention claims a "top down" data model where a data element has an inherent chronological nature and comprises frames with quantitative data and events that are linked between two data elements that both include a common event. Accordingly, Applicant respectfully requests allowance of the pending claims.

Respectfully submitted,
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Dated: May 10, 2004   By: _____
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